

AMENDMENTS TO THE SPECIFICATION

Please amend the Paragraph beginning page 2, line 12 of the specification as follows:

The sole drawing figure FIG. 1 is an isometric drawing of an electronic device powered by a fuel cell ~~having visually readable indicia~~ in accordance with one embodiment of the invention.

FIGs. 2 through 7 are various embodiments of a fuel cell for use within the electronic device of FIG. 1.

Please amend the paragraph beginning page 2, line 17 and bridging pages 2 and 3 of the specification as follows:

While the specification concludes with claims defining the features of the invention that are regarded as novel, it is believed that the invention will be better understood from a consideration of the following description in conjunction with the drawing figures, in which like reference numerals are carried forward. Referring now to the drawing figure 1, a small fuel cell 10 that can be used to power a portable electronic device 12 has incorporated therewith a fuel reservoir 14 that has a means for measuring 16 the amount of liquid fuel 18 that is in the reservoir. The fuel cell operates on hydrogen that is obtained from a liquid hydrocarbon fuel, such as alcohol or other hydrocarbons. The liquid fuel is typically converted into hydrogen by a reforming process. The reservoir that is connected to the fuel cell has an indicia 19 that is readable by a human user of the portable electronic device, for measuring the amount of liquid hydrocarbon fuel that is present in the reservoir. Typically, the indicia 19 works in conjunction with ~~consist of~~ a sight glass, a capacitive element, a resistive element, a transparent portion of the reservoir, a float 30 (see FIG. 2), or an acoustic transmitter coupled with an acoustic receiver. In an alternate embodiment, the level of liquid fuel in the fuel cell is communicated to the user of the electronic device by a display 20, such as a liquid crystal display (LCD) or a series of light emitting diodes (LED) that are appropriately connected to a sensor on or in the reservoir. The display 20 can be conveniently located on either the electronic device or on the fuel cell or on the fuel cell reservoir.

Please amend the paragraph beginning page 3, line 4 of the specification as follows:

Many techniques have been developed to measure the liquid levels and liquid quantities in storage tanks. One system for measuring the fuel level in the fuel tank of a motor vehicle employs a variable resistor within the tank. The wiper arm of the variable resistor is connected through a pivot to a float which monitors the upper level of the fuel in the tank. As shown in FIG. 4, other ~~Other~~ systems use immersion capacitor units 45 or probes in liquid containers or tanks in combination with suitable electrical circuitry and measuring and indicating instrumentation, where the liquid itself forms the dielectric between the plates. The capacitive value of the immersion capacitor is variable and changes with respect to the level of liquid in the container. By constructing the capacitor unit of multiple pairs of plates which are placed in different areas of the container, the effects of liquid sloshing or surging and liquid level shift are reduced, so as to obtain an accurate capacitance value for the immersion unit. The immersion capacitor unit (whether of single pair or multiple pair plate design) is electrically connected into a bridge circuit having two condensers of fixed and equal capacity, each forming an arm of the bridge, the remaining two arms of the bridge being made up of a variable capacitor and the immersion capacitor. The bridge circuit (of well known Wheatstone configuration) is connected to a source of alternating current of predetermined frequency and detector and measurement indicating circuitry. The bridge circuitry is arranged to be in an unbalanced state so long as any liquid remains in the container in the dielectric space between the plates of the immersion capacitor unit.

Please amend the specification by adding the following paragraph before the paragraph beginning page 4, line 9:

In accordance with the present invention, an immersion capacitor can be utilized within a fuel cell system to measure the liquid levels stored within the liquid reservoir as previously described herein. Specifically, in one embodiment of the present invention, a fuel cell system for a portable electronic device can include a fuel cell capable of operating on hydrogen that is obtained from methanol; and a reservoir for storing a supply of methanol, suitably connected to the fuel cell, wherein a fuel quantity measuring means is located within the reservoir. The fuel quantity measuring means preferably comprises an immersion capacitive unit, wherein the supply of methanol in the reservoir forms a dielectric between the plates of the immersion capacitive unit, and electrical circuitry for measuring a capacitance value of the immersion capacitive unit produced using the dielectric. Alternatively, in another embodiment of the

present invention, a fuel cell system for a portable electronic device can include a fuel cell that operates on hydrogen obtained from a liquid hydrocarbon fuel; and a reservoir for containing a supply of the liquid hydrocarbon fuel, said reservoir connected to the fuel cell, wherein a sensing means for measuring the amount of liquid hydrocarbon fuel that is present is located within the reservoir. The sensing means preferably comprises an immersion capacitive unit, wherein the supply of methanol in the reservoir forms a dielectric between the plates of the immersion capacitive unit, and electrical circuitry for measuring a capacitance value of the immersion capacitive unit produced using the dielectric.

Please amend the Paragraph beginning page 4, line 19 of the specification as follows:

As shown in FIG. 3, still ~~Still~~ another embodiment measures the level of fuel in the reservoir by measuring an electrical resistance 40 through the fuel in the reservoir. This is accomplished via conductive elements 35 placed at opposing ends of the reservoir. The conductive elements are used to measure the resistance across the fuel, whereby higher levels of fuel would result in lower resistance readings. The resistance readings are then cross referenced to a lookup table which provides the corresponding fuel level, which is communicated to the user via a display, speech message, light emitting diode gauge, or other common means.

Please amend the Paragraph beginning page 4, line 27 and bridging page 4 and page 5 of the specification as follows:

As shown in FIG. 5, a ~~A~~ further embodiment of the invention utilizes acoustic signals. The signals are transmitted by an acoustic transmitter 50 in the fuel reservoir, the signals are detected by a detector, such as an acoustic receiver 55, appropriately located in the reservoir, a response is measured by the detector, the measurement is compared to a lookup table, and a corresponding fuel level is determined and communicated to the user via a display, speech message, light emitting diode gauge, or other common means. As shown in FIG. 6, alternatively ~~Alternatively~~, a speaker 60 can be used to generate a sine wave signal while the electrical resistance of the speaker coil 65 is measured. Depending on the level of fuel in the reservoir and the corresponding air space above the fuel, the force required by the speaker to move the air in the space above the fuel would result in a given electrical resistance and hence the fuel level can be determined. As shown in FIG. 7, Yet another embodiment of the acoustic measuring method bounces an acoustic signal 70 off the top surface 75 of the fuel to measure the fuel level by determining ~~the~~ a distance 80 from the top of the container to the fuel surface. The distance can

be measured by calculating the time delay between the transmission of the signal from the top of the reservoir towards the fuel surface and receipt of ~~the~~ a reflected signal 85 back at the top of the reservoir.